

WHAT IS CLAIMED IS:

1. A microporous composite membrane comprising a microporous polyolefin membrane and a polypropylene-containing coating layer formed on at least one surface of said microporous polyolefin membrane, wherein said polypropylene has a mass-average molecular weight within a range of 5,000-500,000, and solubility of 0.5 g or more in 100 g of toluene at a temperature of 25°C, and wherein said microporous composite membrane has air permeability (converted to the value at 25-μm thickness) of 50-10,000 seconds/100 cc.
2. The microporous composite membrane according to claim 1, wherein 0.1-5 g of said coating layer is formed on said microporous polyolefin membrane per 1 m<sup>2</sup>.
3. A method for producing the microporous composite membrane of claim 1 or 2, comprising:
  - (a) applying a mixed liquid containing said polypropylene and its good solvent to at least one surface of said microporous polyolefin membrane, removing said good solvent to increase the concentration of said polypropylene, thereby providing the resultant coating layer with a structure in which said polypropylene phase is separated from said good solvent phase, and then removing the remainder of said good solvent;
  - (b) applying said mixed liquid to at least one surface of said microporous polyolefin membrane, cooling the resultant coating layer to provide the coating layer with a structure in which said polypropylene phase is separated from said good solvent phase, and removing said good solvent;
  - (c) applying said mixed liquid to at least one surface of said microporous polyolefin membrane, bringing the resultant coating layer into contact with poor solvent for said polypropylene, selectively evaporating said good solvent to provide said coating layer with a structure in which said polypropylene phase is separated from said poor solvent phase, and then removing said poor solvent; or

- (d) applying a mixed liquid containing said polypropylene, said good solvent and said poor solvent to at least one surface of said microporous polyolefin membrane, selectively removing said good solvent to provide the resultant coating layer with a structure in which said polypropylene phase is separated from said poor solvent phase, and then removing said poor solvent.
- 5
4. A battery separator formed by the microporous composite membrane of claim 1 or 2.
5. A battery comprising a battery separator formed by the microporous composite membrane of claim 1 or 2.